

**Addendum
Phase II Report
Dredged Material Management Plan Study
September 2005**

Upper Saginaw River, Michigan

The following is an addendum to the main report, *Phase II Report, Final Dredged Material Management Plan Study* dated July 2004. This addendum documents the reasons for a construction cost increase and examines whether the recommended plan is still the best alternative.

The *Phase II Report, Final Dredged Material Management Plan Study* dated July 2004, approved by LRD on 8 April 2005, included as the recommended plan implementation of:

Alternative 1 - Develop the Zilwaukee Township Site, West of Saginaw River, into a Dredged Material Disposal Facility (DMDF). This alternative consists of constructing a DMDF on 281 acres, which will provide the required 3,100,000 CY capacity. As such, the site will meet the 20 - year capacity requirement, as mandated in ER 1105-2-100.

During the 401 certification process it was agreed between the Corps of Engineers and the Michigan Department of Environmental Quality (DEQ) that the Corps would provide additional borings at the proposed site in order to insure the DMDF would not allow for seepage of contaminants. After collection of additional soil borings, it was determined that a trench and cutoff wall should be constructed below the alignment of the proposed dikes to prevent under seepage. This cutoff wall will also serve as an inspection trench during construction to locate any drainage tiles or other crossings, as well as a cutoff for seepage under the constructed dikes. The costs for constructing a cutoff wall were not included in the concept design used in the DMMP.

The criteria used for establishing the "Federal standard" (Recommended Plan) and to evaluate the alternatives is in the Federal Register, 33CFR dated April 26, 1988, which states that the recommended dredged material disposal alternative must be engineeringly feasible, environmentally acceptable, and the least costly. A re-evaluation of the alternatives was completed based on the need for each CDF alternative to include an under-seepage protection measure. The environmental impact analysis of the revised Alternative 1 is essentially the same

as for the originally proposed project, the only change has been additional engineering and construction requirements to assure that contaminated materials remain within the CDF. The footprint of the project has not changed, a cutoff wall has been added.

Alternative 2 - Develop the Buena Vista Township Site, East of Saginaw River, into a Dredged Material Disposal Facility. - This alternative consists of a 274-acre farm site of which the MDEQ also considers as farmed wetland, and the MDEQ would require wetland mitigation at this site. As such, only 131 acres of land could be used for a DMDF; the reduced acreage will not meet requirements for the 20 - year capacity of 3,100,000 CY without constructing much larger perimeter dikes to create a taller facility. Also, an active railroad line on the site requires a minimum of a 50 ft offset for construction of dikes, which reduces the capacity. Considering that the Zilwaukee Twp. site and the Buena Vista site are geologically similar (Reference DMMP Technical Appendix A, page A-7) and that both sites have drain tiles for farming, it is concluded that a trench cutoff wall is also needed for Alternative 2, and the trench cutoff wall will be required under EM1110-2-1913. Trench cutoff walls were not included in the July 2004 report for this alternative, but would increase the construction cost an additional \$676,000. See revised Table 3 below. Alternative 2 will not be considered further.

Alternative 3 - Place Dredged Material at the General Motors Powertrain (Saginaw) Metal Casting Operation Landfill. - This Type III landfill has adequate remaining capacity to satisfy the 20-year placement mandate, and is close to the dredging area. However, General Motors requested a release from liability for all dredged material placed in the landfill and all future materials placed there by General Motors. Without the support of the MDEQ on this issue, General Motors later withdrew its site from possible participation in this project. Also, operating expenses would be higher than using a typical CDF, since Type III landfills require that all placed material be considerably dryer than the dredging process normally produces. The triple handling of the dredge material through decanting, then trucking to the landfill, then placing the material (not including the tipping fee) makes this alternative costly. Also, the drain tiles for the landfill connect into a waste water treatment plant. They require a carbon filter to treat the effluent. The addition of a carbon filter has been estimated at \$1 million. Therefore Alternative 3 is still not the least costly alternative and will not be considered further.

Alternative 4 - Beach Nourishment - This alternative considers the feasibility of using the material to enhance area beaches or return the material into the natural system from which it came. The contaminated nature of the sediment makes it unsuitable for beneficial reuse. As such, Alternative 4 is not engineeringly feasible or environmentally acceptable and will not be considered as a candidate for implementation.

Alternative 5 - Recycle the Dredged Material - which consists of a hydrocyclone process of the dredged material. The July 2004 report comparison for Alternative 1 was \$1,500,000 construction cost for 3,100,000 cubic yard capacity, which equates to \$0.48 per cy. The new calculation for Alternative 1 increases the unit price from \$0.48 per cy to \$0.76 per cy, versus \$32.17 per cy for recycling. Therefore Alternative 5 is still not the least costly alternative and will not be considered further.

TABLE 3 - Summary of Alternatives				
Alternative	Placement	Capacity cubic yards	Construction Costs (\$)	Recommend to Phase II
Zilwaukee Twp. Site	Upland	3,100,000	2,350,000	Y
Buena Vista Twp. Site	Upland	3,100,000	2,876,000	N
General Motors	Upland	5,000,000	----- ²	N
Beach Nourishment	Upland	Unlimited	-----	N
Recycle Dredged Material	Upland	Unknown ¹	-----	N
No Action	N/A	N/A	-----	N
1. The dredged material that was determined to be recyclable, yields only 15.86% clean sand. 2. Per discussion with General Motors, tipping fee range \$8-\$10 per yard equates to \$24.8M- 31.0M.				

CONCLUSION: Alternative 1 - *Develop the Zilwaukee Township Site, West of Saginaw River, into a Dredged Material Disposal Facility* continues to meet the criteria for the recommended plan. It is engineeringly feasible, environmentally acceptable, and the least costly.